Editorial Advisory Committee

Manson Benedict
E. Richard Cohen
E. C. Creutz
Frank G. Dawson
Paul Gast
D. H. Gurinsky
A. F. Henry
A. A. Johnson
C. H. Millar
L. W. Nordheim
Hugh C. Paxton
Fred W. Thalgott

ANS Officers

JAMES R. LILIENTHAL
President
JOHN W. SIMPSON
Vice President/President Elect
J. ERNEST WILKINS, JR.
Treasurer
RAYMOND D. MAXSON
ASSISTANT Treasurer
OCTAVE J. DU TEMPLE
EXECUTIVE SECRETARY

ANS Publications Staff

Norman H. Jacobson
Publications Manager
Ruth Farmakes
Assistant Staff Editor
Barrett M. Schroeder
Copy Editor
Siegfried H. Krapp
Production Manager
Kathryn Froehlich
Production Assistant

Composition

BELJAN, ANN ARBOR, MICH.

NUCLEAR SCIENCE AND ENGINEERING is published monthly by the American Nuclear Society, Incorporated, with executive and business offices at 244 East Ogden Avenue, Hinsdale, Illinois 60521—telephone 312/325-1991. Subscription rate is \$90/3 volumes, calendar year; \$35/single volume, single copy price is \$10 (special issues slightly higher): address subscription orders to the American Nuclear Society (back issues of Volumes 1-17 are available from Academic Press, 111 Fifth Avenue, New York, N.Y.). Second-class postage is paid at Hinsdale, Illinois and at additional mailing offices. NUCLEAR SCIENCE AND ENGINEERING is printed in Danville, Illinois. Copyright © 1973 by the American Nuclear Society, Inc. Inquiries about the distribution and delivery of NUCLEAR SCIENCE AND ENGINEERING and requests for changes of address should be directed to the publisher, the American Nuclear Society, 244 East Ogden Avenue, Hinsdale, Illinois 60521. Allow 6 weeks for a change to become effective.

NUCLEAR SCIENCE and ENGINEERING®

VOLUME 51, NUMBER 1, MAY 1973

Contents

TECHNICAL PAPERS Fast Reactor Design Optimization System with a Method of Nonlinear Programming 1 Kotaro Inoue On the Control of Spatial Xenon Oscillations. A. M. Christie and C. G. Poncelet Measurement and Evaluation of Total Neutron Cross-Section Minima in Elemental Iron from K. A. Alfieri, R. C. Block, and P. J. Turinsky 25 Low Energy Components of Scattered Gamma Radiation Susumu Minato Evaluation of Lumped Parameter Heat Transfer Techniques for Nuclear Reactor Applications . . . D. M. France and T. Ginsberg 41 The Energy Distribution of Delayed Fission Neu-52 trons..... S. Shalev and J. M. Cuttler TECHNICAL NOTES A New Method of Solving the Multimode Reactor J. C. Turnage On a Multidirectional Modal Representation for A. A. Harms and S. A. Kushneriuk An Exact Analytical Solution of an Elementary Critical Condition C. E. Siewert A Simple Analytic Transient Flux Expression for Use with Asymptotic Diffusion Theory. 78 L. E. Beghian, I. A. Forbes, and V. C. Rogers Absolute Neutron Yields from Alpha-Particle Interaction with Thick Targets of Natural Carbon 83 J. K. Bair Heat Conduction in the UO2-Cladding Composite Body with Simultaneous Solidification and Melt-88 BOOK REVIEWS..... LETTERS TO THE EDITOR Comments on "Merit Index for Gas-Cooled Reactor Heat Transfer"..... D. C. Leslie Reply to "Comments on Merit Index for Gas-Cooled Reactor Heat Transfer'"...... G. Melese-d'Hospital 93

94